

WHAT IS CLAIMED IS:

1. A channel spreading device for a CDMA (Code Division Multiple Access) communication system, comprising:

- a plurality of channel transmission circuits;
- a memory for storing orthogonal code numbers which cannot maintain an orthogonality due to an orthogonal code which a circuit data user uses at a maximum data rate; and

10 a controller for reading from the memory an orthogonal code number used at the maximum data rate to primarily allocate the read orthogonal code number such that circuit data is spread and transmitted by a corresponding one of the channel transmission circuits, when there is data transmission request from the circuit data user and a packet data user, and reading an available orthogonal code number out of the orthogonal code numbers stored in the memory to allocate the read orthogonal code number such that packet data is spread and transmitted by a corresponding one of the channel transmission circuits.

2. The channel spreading device as claimed in claim 1, further comprising a Walsh pool generator for generating orthogonal code numbers which cannot maintain an orthogonality with an orthogonal code used at the maximum data rate by the circuit data user, when said orthogonal code is in use.

3. The channel spreading device as claimed in claim 2, wherein the Walsh pool generator sequentially adds multiples of an orthogonal code length used at the maximum data rate to the orthogonal code number used at the maximum data rate within a full length of the orthogonal code, so as to generate orthogonal code numbers.

4. The channel spreading device as claimed in claim 1, wherein the controller determines whether it is possible to transmit the packet data at a data rate requested by the circuit data user, and determines, when the packet data can be transmitted, an orthogonal code number which is available at the data rate requested by 5 the packet data user.

5. The channel spreading device as claimed in claim 4, wherein the controller allocates the available orthogonal codes according to a priority of the packet data users when at least two packet data users request transmission of packet data at a 10 given data rate.

6. The channel spreading device as claimed in claim 1, wherein the channel transmission circuit spreads the circuit data with an orthogonal code corresponding to an orthogonal code number for the maximum data rate out of the orthogonal codes from the 15 controller.

7. A channel spreading device for a CDMA communication system, comprising:

a storage medium for storing orthogonal code numbers which cannot maintain an 20 orthogonality when an orthogonal code for a maximum data rate is used;

a controller for determining whether the respective orthogonal code numbers stored in the storage medium are available at a given data rate, when at least one data user requests data transmission at the given data rate, and outputting the determined available orthogonal code numbers and control signals according to the determination result;

25 a plurality of channel transmitters, provided in association with the orthogonal code numbers from the controller, for spreading data from the data user with an orthogonal code corresponding to the orthogonal code number from the controller; and

a plurality of multipliers for multiplying outputs of the channel transmitters by

control signals from the controller.

8. The channel spreading device as claimed in claim 7, wherein the storage medium stores orthogonal code numbers generated by sequentially adding multiples of an orthogonal code length used at the maximum data rate to the orthogonal code number used at the maximum data rate within a full length of the orthogonal code, and the orthogonal code number used at the maximum data rate.

9. The channel spreading device as claimed in claim 7, wherein the controller determines whether other data users can transmit data at a data rate based on a primary data user having a top priority out of the data users; determines, when other data users can transmit the data, orthogonal code numbers which are available at the data rate from said other data users; and outputs the control signals corresponding to the determined orthogonal code numbers.

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10. The channel spreading device as claimed in claim 9, wherein the controller outputs the control signals according to the priority of other data users when at least two other data users request data transmission at a given data rate in a state where there exists the primary data user.

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11. The channel spreading device as claimed in claim 7, wherein the channel transmitter spreads the data from the primary data user with an orthogonal code corresponding to the orthogonal code number for the maximum data rate out of the orthogonal codes from the controller.

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12. A channel spreading device for a CDMA communication system, comprising:

a Walsh pool generator for generating orthogonal code numbers which cannot

maintain an orthogonality when an orthogonal code for a maximum data rate is used;

a memory for storing the orthogonal code numbers generated from the Walsh pool generator and an orthogonal code number used at the maximum data rate;

5 a controller for determining whether the respective orthogonal code numbers stored in the memory are available at a given data rate, when at least one data user requests data transmission at the given data rate, and outputting the determined available orthogonal code numbers and control signals according to the determination result;

10 a plurality of channel transmitters for generating an orthogonal code corresponding to the orthogonal code number from the controller and spreading data from the data user with the generated orthogonal code; and

a plurality of multipliers for multiplying outputs of the channel transmitters by control signals from the controller.

13. The channel spreading device as claimed in claim 12, wherein the Walsh 15 pool generator sequentially adds multiples of an orthogonal code length used at the maximum data rate to the orthogonal code number used at the maximum data rate within a full length of the orthogonal code, so as to generate orthogonal code numbers.

14. The channel spreading device as claimed in claim 12, wherein the 20 controller determines whether other data users can transmit data at a data rate based on a primary data user having a top priority out of the data users; determines, when other data users can transmit the data, orthogonal code numbers which are available at the data rate from said other data users; and outputs the control signals corresponding to the determined orthogonal code numbers.

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15. The channel spreading device as claimed in claim 14, wherein the controller outputs the control signals according to the priority of other data users when at least two other data users request data transmission at a given data rate in a state where

there exists the primary data user.

16. The channel spreading device as claimed in claim 14, wherein the channel transmitter spreads the data from the primary data user with an orthogonal code corresponding to the orthogonal code number for the maximum data rate out of the orthogonal codes from the controller.

17. A channel spreading method for a CDMA communication system, comprising the steps of:

10 storing orthogonal code numbers which cannot maintain an orthogonality due to an orthogonal code which a circuit data user uses at a maximum data rate;

determining whether the stored orthogonal code numbers are available at a given data rate, when at least one data user requests data transmission at the given data rate, and outputting the determined available orthogonal code numbers and control signals
15 according to the determination result;

generating an orthogonal code corresponding to the output orthogonal code number and spreading data from the data user with the generated orthogonal code; and
multiplying outputs of the channel transmitters by the control signals.

20 18. The channel spreading method as claimed in claim 17, wherein said stored orthogonal code numbers include orthogonal code numbers generated by sequentially adding multiples of an orthogonal code length used at the maximum data rate to the orthogonal code number used at the maximum data rate within a full length of the orthogonal code, and the orthogonal code number used at the maximum data rate.

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19. The channel spreading method as claimed in claim 17, wherein the control signals are generated by determining whether other data users can transmit data at a data rate based on a primary data user having a top priority out of the data users;

determining, when other data users can transmit the data, orthogonal code numbers which are available at the data rate from said other data users; and outputting the control signals corresponding to the determined orthogonal code numbers.

5 20. The channel spreading method as claimed in claim 19, wherein the available orthogonal code numbers are allocated according to the priority of other data users when at least two other data users request data transmission at a given data rate in a state where there exists the primary data user.

10 21. A channel spreading method for a CDMA communication system, comprising the steps of:

 determining orthogonal code numbers which are unavailable at a data rate lower than a maximum data rate, according to an orthogonal code length and an orthogonal code number for the maximum data rate;

15 generating orthogonal code numbers which cannot maintain an orthogonality when the orthogonal code for the maximum data rate is used;

 storing the generated orthogonal code numbers and the orthogonal code number used at the maximum data rate;

20 primarily allocating the orthogonal code corresponding to the orthogonal code number for the maximum data rate to a supplemental channel for transmitting the circuit data, when a circuit data user and a packet data user request transmission of circuit data and packet data at a given data rate; and

 determining an orthogonal code number which is available at the data rate for the packet data, out of the orthogonal code numbers, and allocating the orthogonal code corresponding to the determined orthogonal code number to the supplemental channel for transmitting the packet data.

22. The channel spreading method as claimed in claim 21, wherein the

orthogonal codes are generated by sequentially adding multiples of an orthogonal code length used at the maximum data rate to the orthogonal code number used at the maximum data rate within a full length of the orthogonal code.

5 23. The channel spreading method as claimed in claim 21, further comprising the step of determining whether it is possible to transmit the packet data at a data rate requested by the circuit data user, and determining, when the packet data can be transmitted, an orthogonal code number which is available at the data rate requested by the packet data user.

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24. The channel spreading method as claimed in claim 23, wherein the available orthogonal codes are allocated according to a priority of the packet data users when at least two packet data users request transmission of packet data at a given data rate.

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25. A channel spreading method for a CDMA communication system, comprising the steps of:

receiving an orthogonal code number which a circuit data user uses at a maximum data rate, and an orthogonal code length for the maximum data rate;

20 generating orthogonal code numbers which cannot maintain an orthogonality due to an orthogonal code used at the maximum data rate, by sequentially adding multiples of the received orthogonal code length to the received orthogonal number; and

 storing the received orthogonal code number and the generated orthogonal code numbers in a Walsh pool.

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26. The channel spreading method as claimed in claim 25, wherein the Walsh pool stores only the orthogonal code numbers within a full length of the orthogonal code.

27. A channel spreading method for a CDMA communication system, comprising the steps of:

primarily allocating an orthogonal code corresponding to an orthogonal code number for a maximum data rate and allocating the read orthogonal code to a supplemental channel for transmitting circuit data, when a circuit data user and a packet data user request transmission of circuit data and packet data; and

determining an orthogonal code number which is available at a data rate of the packet data out of the orthogonal code numbers stored in the memory, and reading the determined orthogonal code to allocate the read orthogonal code to the supplemental channel for transmitting the packet data.

28. The channel spreading method as claimed in claim 27, further comprising the step of determining whether it is possible to transmit the packet data, according to the data rate for the circuit data, and determining, when the packet data can be transmitted, an orthogonal code number which is available at the data rate for the packet data.

29. The channel spreading method as claimed in claim 28, wherein the available orthogonal codes are allocated according to the priority of the packet data users when at least two packet data users request transmission of packet data at a given data rate.